The Institute for Advanced Technology
CDC / C-E-I-R, 5272 RIVER ROAD, WASHINGTON, D. C.   20016

T NELSON
BOX 1546
POUGHKEEPSIE N Y   12603

DATA COMMUNICATIONS SYSTEMS

This seminar is intended for the data processing man who is preparing for an on line, real time or other system, which involves data communications. The seminar is designed as an orientation to the hardware and software considerations important to successful systems design and to data communications concepts and terminology.

Whether you are now involved in decisions about data communications, or simply realize your need to bone up on this rapidly growing aspect of the data processing business, the "Data Communications Systems" seminar is important to you. Though it will not turn you into a communications engineer, it will enable you to talk to one knowledgeably.

THE THIRD GENERATION OF COMPUTERS HAS ARRIVED. Literally thousands of the new model machines have been installed across the country. This new equipment is distinguished from the preceding two generations by many significant features. Of these, perhaps the most important is the ability to receive and send large quantities of data from remote locations. This facet of the third generation computer in effect adds a new dimension to the tasks of the systems planner and programmer which is usually described under the heading of "Data Communications." To make these new systems work properly, a knowledge of data communications equipment and techniques is now a "must."

JOSEPH E. HANNAH served as a communications officer in the Department of the Air Force and was involved in the design and implementation of the Air Force Global Communications System. Upon leaving the Air Force he joined Western Union as the Director of Communications Systems Development where he was directly involved in the design and implementation of the Department of Defense AUTODIN System and the General Services Administration Advanced Record System as well as other government and industry systems. He later joined Control Data Corporation as Manager of Government Communications Systems. Mr. Hannah is presently the Manager of the CDC Communications District. In this capacity he is involved in the design and implementation of message entry, switching and source data collection systems involving the integration of communications and data processing devices into a common system.

DONALD A. GLOIN is Director of Technical Operations, MAC Division, CDC. He previously was Supervisor of Training Department for NORAD and has held technical positions with RCA, Burroughs, and Norelco. Mr. Gloin was a Professional Lecturer and Associate Staff Member, University of Western Ontario from which he holds a B.A. degree in Business Administration. Mr. Gloin was also Lecturer and Staff Member of Reyerson Institute of Technology.

WILLIAM D. SKEES is Applications Staff Specialist for the Conversational Systems Development Department of the Data Centers Division Technical Staff of C-E-I-R CDC. He is currently heading the project for Compilers and Languages in this department. Prior to joining C-E-I-R he was Manager of Systems and Operations at the University of Kentucky. He has been a consultant in teleprocessing at L'Ecole Polytechnique de L'Universite de Lausanne, in Switzerland, and has done other telecommunications consulting in the U.S. Mr. Skees holds an M.S. in mathematics from the University of Illinois, and an A.B. degree in mathematics and psychology. He has also done graduate work in clinical psychology.

Registration

Tuition, including course material and luncheons, is $195 for the first student and $175 for each additional student from the same organization. Checks for tuition should be made payable to the Institute for Advanced Technology. Special rates are available to organizations wishing to utilize IAT seminars on a contractual basis.

Location — Accommodations

Seminars are conducted at the hotels listed below. Cost of hotel rooms are not included in the tuition but we will make reservations for you if requested. Please use the registration card to indicate accommodations desired. (Hotels will hold a block of rooms for seminar participants until two weeks before the seminar).

December 4-6 and January 20-22
Sheraton-Silver Spring
8727 Colesville Road
Silver Spring, Maryland 20910
Room rates: Single $13.00   Twin $18.00

February 17-19
The Park-Sheraton Hotel
7th Avenue & 56th Street
New York, New York 10019
Room Rates: Single $15.00   Twin $20.00

The Sheraton-Silver Spring is a mile from the Capital Beltway and is only minutes from downtown metropolitan area. The hotel is serviced by direct limousine to Washington airports. Free parking is available to seminar participants.

Over 30 Courses Available

in 2 to 5 day seminars

Seminars are offered at various cities throughout the country. Private, in-plant sessions can also be arranged. A sampling of seminars currently scheduled:

EDP Personnel Management for the Line Manager
December 2-3, Los Angeles

Microfilm Information Systems
December 11-13, Washington, D.C.

Production Planning, Scheduling and Control
December 12-13

COURSES FOR 1969

Computer Graphics
Introduction to Operations Research
Model Building in Economics and Industry
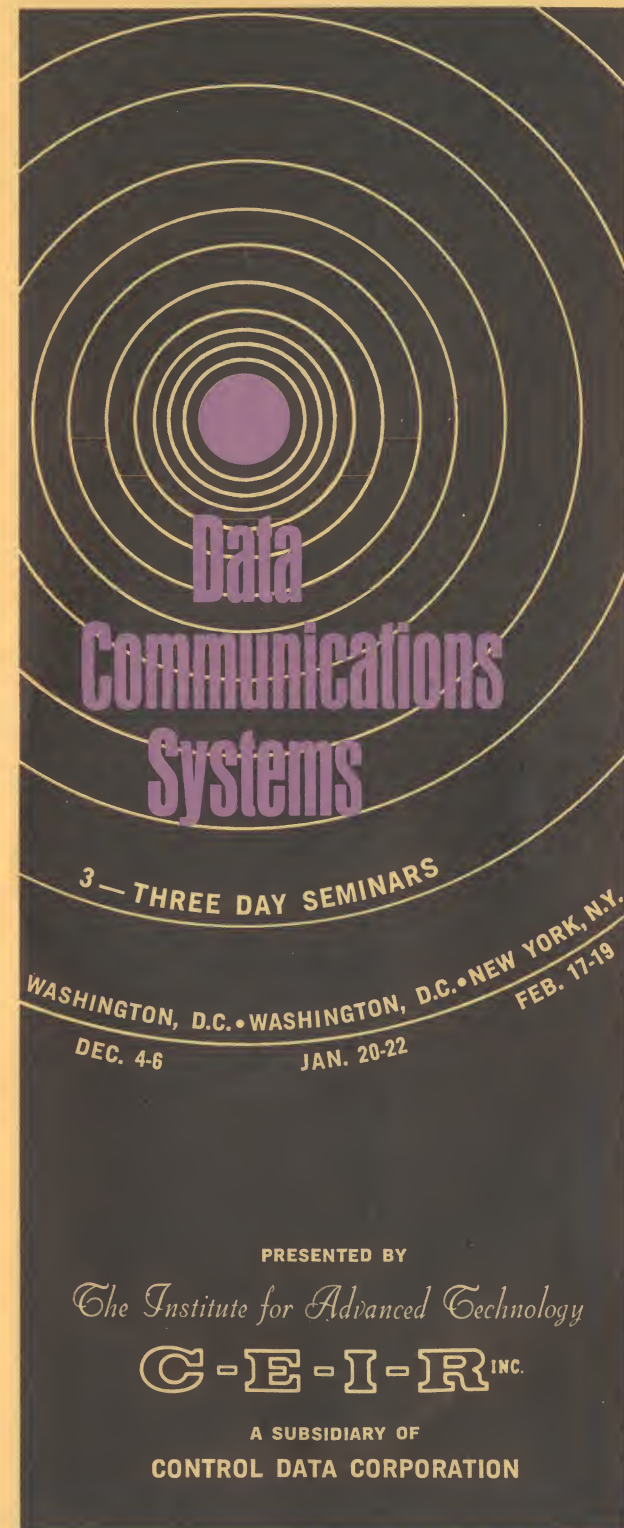**Optical Character Recognition**
Process Control

For outlines, or to be placed on the mailing list for future announcements, write:

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Data Communications Systems

3 — THREE DAY SEMINARS

WASHINGTON, D.C. • WASHINGTON, D.C. • NEW YORK, N.Y.

DEC. 4-6   JAN. 20-22   FEB. 17-19

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T U NELSON
VASSAR COLLEGE
POUGHKEEPSIE NY 12601

Seminar participants should have at least one year of programming experience.

Seminar is designed for programming supervisors who are looking for new ideas for solving problems with a minimum drain of time, effort and dollars.

It is aimed at experienced programmers who desire to overcome the frustrations of routine tasks leaving more time for creative programming.

It will also be most informative for Junior Systems Analysts involved in program specifications and who are responsible for system turnover.

Like other unpleasant but necessary tasks, the work of documenting and debugging computer programs can be rendered much more palatable by a scientific, orderly and systematic approach that offers the dual virtues of getting the job done rapidly and freeing the programmer for creative efforts in a minimum of time.

With the rapid proliferation of computer languages, subroutines, and programs — and the tremendous investment they represent — meticulous D&D is becoming essential, not just to save money, but to prevent chaos.

New insights and working knowhow to be presented can slash substantially the time now required for your D&D efforts, and perhaps even more important, will insure that they are accomplished properly.

HOTELS — Seminars are conducted at the following hotels. Cost of hotel rooms are not included in tuition, but we will make reservations for you if requested. Please indicate accommodations desired on registration card. (Hotels will hold a block of rooms for seminar participants until two weeks before the seminar.)

December 9-11
    Sheraton-Silver Spring
    8727 Colesville Road
    Silver Spring, Maryland 20910

Room Rates: Single $13.00   Twin $18.00

January 27-29
    Sheraton Hotel
    1725 J. F. Kennedy Boulevard
    Philadelphia, Pennsylvania 19103

Room Rates: Single $14.50   Twin $18.50

The Sheraton-Silver Spring is a mile from the Capital Beltway and is easily accessible to the entire metropolitan area and by direct limousine service to Washington airports. The hotel offers free parking to seminar participants.

OVER 30 COURSES AVAILABLE in Management, Data Processing, and Mathematical and Statistical Sciences . . .

A sampling of seminars currently scheduled:

- Basic Systems and Procedures Including Data Processing Concepts
    November 6-8, Washington, D. C.
- Introduction to EDP for Managers
    November 13-15, Philadelphia
- Data Communications Systems
    November 13-15, New York
- Computer Operations Management
    November 13-15, Minneapolis
- Nonlinear Programming
    November 13-15, Los Angeles
- Optical Character Recognition
    November 18-20, Washington, D. C.
- Time-Sharing Systems
    November 18-20, New York
- Multivariate Analysis
    November 18-22, Washington, D. C.
- EDP Personnel Management for the Line Manager
    November 21-22, New York
- Techniques of Data Analysis
    December 4-6, New York

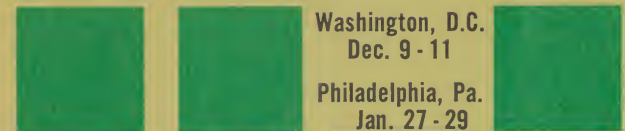For outlines, or to be placed on the mailing list for future announcements, write:

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DOCUMENTATION AND DEBUGGING

PROGRAMMING PHILOSOPHY AND COMMUNICATIONS

Washington, D.C.
Dec. 9 - 11

Philadelphia, Pa.
Jan. 27 - 29

TWO
Three-Day
SEMINARS

THE INSTITUTE FOR ADVANCED TECHNOLOGY

C-E-I-R INC.

A SUBSIDIARY OF CONTROL DATA CORPORATION

FIRST DAY

Documentation

PURPOSES OF DOCUMENTATION
Identification of needs and requirements for reference, control, evaluation, and planning.

CONCEPTS OF DOCUMENTATION
What documentation should consist of under various conditions.

ELEMENTS OF DOCUMENTATION
Classification, relevance, content, and sequence of elements of documentation.

CURRENT FORMS OF DOCUMENTATION
Review of various types of forms and their application.

AUTOMATED DOCUMENTATION
Discussion and explanation of available automated block-diagramming and documentation program systems.

CURRENT PRACTICES IN DOCUMENTATION
Review and critique of documentation procedures and standards used by several government, industrial, and service organizations.

SECOND DAY

DOCUMENTATION SUPPORT ACTIVITIES
Services provided by a staff support group in documentation.

PROBLEMS OF DOCUMENTATION
Evaluation of implementation problems for maintaining valid documentation, and discussion of their solution.

CASE STUDY IN DOCUMENTATION PRACTICES
Examination of documents and concepts, procedures, and standards in use in a large computer-seasoned industrial organization.

PROGRAM DOCUMENTATION STANDARDS
Review of standards development at the organizational, national, and international level (e.g. USA Standards Institute).

Program Debugging

DEFINITION AND SCOPE OF DEBUGGING
Defining when a program is debugged; error-free coding and its cost.

PLANNING FOR DEBUGGING
Criteria for estimating test time; actual versus elapsed time; testing short-cuts.

TYPES AND SOURCES OF PROGRAM FAILURES
Errors in coding and control, program analysis, mathematical analysis, and obsolescence; from logic, poor communication, programmer carelessness, operator mistake, or machine malfunction.

THIRD DAY

PROBLEMS OF DEBUGGING
Identifying symptoms and isolating causes.

METHODS AND TECHNIQUES OF BUG DETECTION
Review of commonly used approaches to error detection and removal.

SOFTWARE AIDS FOR DEBUGGING
Detailed description of several software systems.

HARDWARE UPGRADING EFFECT ON DEBUGGING
Hardware conversion; staff reorientation; expected inefficiencies.

UNIQUE CHARACTERISTICS OF REAL-TIME DEBUGGING
Unrepeatable errors; equipment and program interaction; logic complexity; levels of testing.

IMPACT OF PROGRAMMING LANGUAGES ON DEBUGGING
Handicaps and advantages; improving conditions for overcoming the former and enhancing the latter.

SUBSEQUENT SYSTEM TESTING
Anticipating and minimizing later system errors.

PERFORMANCE EVALUATION
Practical extent of measuring debugging effectiveness.

Program Planning

CAUSES OF PROGRAM ERRORS
Reasons for occurrence, by level of organization and their effects.

PREVENTIVE MEASURES VERSUS CURES
Discussion of methods for preventing errors and encouraging good documentation.

EFFECTS OF PROGRAMMING ENVIRONMENT ON DEBUGGING
Stimulating programming efficiency and establishing procedural practices.

SUMMARY AND CONCLUSION
Open discussion; questions and answers.

WILLIS J. LUTHER is Director of Data Centers Division Technical Staff, Control Data Corporation. His major projects include Transportation Planning, Linear Programming, ZIP IS&R Code Application System, and various civil electrical engineering applications. He is especially competent in large-scale business systems, systems software, and programming management. He has authored numerous publications and papers relating to the computer field, including a Standards and Procedures Directory for CDC-DCD. Mr. Luther attended Southeastern University and the University of Minnesota.

RONALD W. HENRY is Supervisor of Urban Affairs Section, Analytical Services Department, Twin Cities Data Center. Previously, he was Manager of Physical Sciences Department, Data Centers Division Tech Staff, Control Data Corporation. He supervised such projects as Urban Planning, Structural Engineering, Electric Utilities, Crystallography, and CRT Display and Microfilm. He has many papers and publications in the computer sciences to his credit. Mr. Henry holds a B. A. degree in Mathematics from the University of Minnesota.

JOHN W. McINNIS is Manager of Technical Support Department, Data Centers Division Tech Staff of Control Data Corporation. He has served as project leader on many important programs and systems. He is especially competent in analysis and programming of management information systems and other business applications including accounting systems. His experience also includes information storage and retrieval techniques, simulation techniques, data reduction, operating systems and input-output routines. He is currently responsible for the documentation and programming standards area for the Data Centers Division. Mr. McInnis holds a B. A. degree from the University of Minnesota.

A practical solution to the problem of continuing education in a field where advanced techniques have a habit of becoming obsolete "overnight."

seminar designed for:

Senior analysts and management tasked with the responsibility for developing, maintaining or upgrading a management information system.

content in brief:

An introduction to MIS will be followed by a presentation of specific methods to relate it to management. Step-by-step procedures will show how to develop, maintain, and upgrade a management information system based on an ability to understand and identify the characteristics and flow of data. Examination of real case studies will provide participants a practical understanding of MIS.

about C-E-I-R

492 of the Fortune "500" use our data processing seminars. Because a computer is no better than the people using it.

Over 30 courses available in 2 to 5 day seminars

Seminars are offered at various cities throughout the country. Or a private in-plant seminar can be arranged. Fees quoted on request. A sampling of seminars currently scheduled:
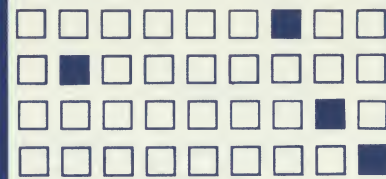
☐ Urban Planning —
Process and Problems
October 17-18, New York City

☐ Project Planning and Control
Systems for Data Processing
October 23-25, Washington, D. C.

☐ Basic Systems and Procedures
Including Data Processing Concepts
November 6-8, Washington, D. C.

☐ Microfilm Information Systems
November 6-8, Los Angeles

☐ Introduction to EDP for Managers
November 13-15, Philadelphia

☐ Data Communications Systems
November 13-15, New York City

☐ Time-Sharing Systems
November 18-20, New York City

☐ Optical Character Recognition
November 18-20, Washington, D. C.

☐ Production Planning, Scheduling
and Control
November 21-22, Washington, D. C.

☐ Time-Series Analysis
December 9-13, Washington, D. C.

For an outline of these courses, or to be placed on the mailing list for seminar announcements, write:

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2 three day seminars

☐ DECEMBER 2 - 4
WASHINGTON, D. C.

☐ JANUARY 20 - 22
NEW YORK

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(place of seminar)

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(date of seminar)

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TITLE_____

ADDITIONAL PARTICIPANT_____

TITLE_____

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